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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,956	05/24/2000	Anand Raghunathan	A7680	5487

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EXAMINER	
ROSSOSHEK, YELENA	

ART UNIT	PAPER NUMBER
2825	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/576,956	RAGHUNATHAN ET AL.	
	Examiner	Art Unit	
	Helen Rossoshek	2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 4-9* is/are rejected.

7)☒ Claim(s) *2 and 3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This is in response to the Application 09/576,956 filed 05/24/2000 and amendment filed 11/08/2004.

2. Claims 1-9 remain pending in the Application.

3. Applicant's arguments have been fully considered. Examiner finds them not persuasive.

Claim Objections

4. Claim 1 is objected to because of the following informalities: according to the logical sequence of going in the process of the loop step g) has to come before the step f) ant the last limitation in the claim has to be ended with the period.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1 and 4-9 are rejected under 35 U.S.C. 102(a) as being anticipated by Lahiri et al. ("Fast performance of bus-based system-on-chip communication architectures", IEEE/ACM International Conference).

With respect to claim 1 Lahiri et al. teaches receiving a partitioned system, communication architecture topology, input traces and performance matrices using tools POIS and PTOLEMY to partition (manually or automatically) into HW and SW and map

this parts to pre-designed core (Pages 568, 569), wherein specifically the tool PTOLEMY provides performance estimation by simulation environment within the abstract model of communication between system components as a set of symbolic computation and communication traces for each component on the partitioned and mapped system specification (Page 569); analyzing and creating communication analysis graph (CAG) using a data structure (bus and synchronization event graph) representing the traces as a graph (Page 569); partitioning communication instances to create partition clusters by generating the augmented BSE graph (clusters) which contain additional vertices and then splitting bus transfer vertices into smaller vertices (Page 569); evaluating cluster statistics related to the partition clusters and assigning parameter values to the partition clusters to form a new system with new communication architecture within the estimator which traverse and manipulate the BSE graph and computes a time-stamp for each vertex in the augmented BSE graph, wherein the time-stamps of the vertices generate various outputs (system with new communication architecture) (Page 569); reanalyzing the new system and recomputing performance metrics by using the results of performance estimation to modify the bus architecture (Page 569); if performance is improved then synthesizing CATs to realize optimized protocols can repeat the modification or stop if satisfaction has been reached since the process is iterative (Page 569); if performance is not improved then returning to step (c) within the ability to repeat the performance estimation and modification the bus architecture (Page 569).

With respect to claims 4-9 Lahiri et al. teaches step d is accomplished by deriving a metric that penalizes a partition having a negative impact on delays of communication events in other partitions as shown in the Case 2 of the Example 1 (Page 570) the wait time for component C_1 was increased since component C_2 has higher priority to access the bus; analyzing the CAG and evaluating for each partition pair CP_i CP_j an amount of time for which communication events that belong to CP_i are delayed due to events from CP_j to form delay statistics within the ability of the system traversing and manipulating the BSE graph (CAG) to compute a time-stamp and changing the bus-related statistics such as amount of time each component spends waiting for the bus, handshaking with the arbiter, and waiting for synchronization events from other components (Page 569); combining the delay statistics into formula that produces an optimum parameter assignment as shown on the Fig. 8 wherein programming code demonstrates Example 1 including calculating delay statistics for Case 1 and Case 2 (Page 570); the parameter assignment is done using heuristics within the ability of the method working in the loop in the iterative manner, modifying the bus architecture and trying again until desired result is achieved (Page 569); the parameter is priority as demonstrated in the Example 1 (Page 570); the parameter is DMA block size (Page 569); the parameter assignment takes into account hardware complexity of implementing the parameter since DMA size is the parameter assigned to each component (of the hardware) (transmition of data in cluster or chunk) and there is relations between DMA size and priority of bus access (Page 568).

Allowable Subject Matter

7. Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of claims does not teach measuring impact of individual communication instance delays on system performance during analyzing the CAG, as a result of the analysis indicating measured performance impact of an instance as a sensitivity and grouping instances with the same sensitivity into the same partition as claimed.

Remarks

8. In reply to the argument that Lahiri et al dies not teach of the communication architecture: Lahiri et al. does teach design of bus-based System-on-Chip (SOC) communication architectures, where accurate performance analysis is to drive and support design of bus-based SOC communication architecture as stated in the abstract on the Page 566 lines 2, 3, and in Introduction on the Page 566 lines 7, 8 and wherein analysis is a part of design (Page 568, section III.), which also confirmed by the title of the article.

In reference to the teaching the communication clusters by Lahiri et al., the Specification of the instant Application on the Page 34 discloses the Lahiri et al. article stating that "The vertices in the graph represent clusters of computations and abstract communications performed by the various components during the system execution".

Despite Applicant's argument about realizing optimized protocols Lahiri et al. teaches on the Pages 567 and 568 **selection** of bus architectures and protocols to

optimize system performance (first paragraph of the section II. Effect of Bus Architecture and Protocols on System Performance; first paragraph of the section B. Effect of Bus Protocols on Performance).

Based on this disclosures in Lahiri et al. the rejection under 35 U.S.C. § 102 is maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen Rossoshek whose telephone number is 571-272-1905. The examiner can normally be reached on 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner
Helen Rossoshek
AU 2825

A. M. Thompson
Primary Examiner
Technology Center Z800